

# botenstoff

SPECIAL



# Health Care Data





An interview with Petri Lehto

# Health data and digitalization: "The opportunity for a revolution"

On June 4th, Graz will emerge as the focal point for Austrian health data enthusiasts. The "Austrian Life Science Day" is entirely focused on this groundbreaking topic. Prior to the event, we had the privilege of securing an interview with the keynote speaker, a prominent Finnish healthcare data specialist.

**How would you assess the significance of health care data in driving advancements within the life sciences field globally, and specifically in Europe?**

Life science is among the fastest growing fields globally due to the potential that health data and digitalization can bring to health care. There is a huge global demand for new solutions in health care since we know now well that health data together with digitalization provides us with an opportunity to bring a revolution there. EU markets are still very fragmented but with the new European Health Data Space regulation we will get a much more unified environment for using health data which can be a huge advantage to Europe even when compared to the USA.

**What role do you envision health care data playing in shaping the future of research, drug development, and healthcare delivery?**

The great thing about health data is that it can generate benefits in so many areas of health care, from research all the way to clinics. There is really no area where it is not applicable. But what we need to do is to make sure our environment allows and enables the use of it. For instance, legislations around research and care must be adjusted to it. Also, we need to make sure to generate and store data so that it can be then applied to different uses. Quality needs also to be guaranteed. This all requires lots of work but the rewards are so huge that there is no alternative to it.

**Can you elaborate on Finland's unique approach to integrating health care data across various sectors and stakeholders, and how this has contributed to the country's leadership in health care data utilization?**

We started to pay close attention to health data some 10 years ago. It was partly based on the understanding that we have built and collected vast amounts of data in different registries and health records. This coincided with the first Life Science Strategy compiled in Finland. It enabled us to raise health data as a focus area of the strategy and set a high ambition to it. Stakeholders started to understand the value in it. We know that the infrastructure - legislation especially - needs still to be improved, we know it, but we have already tools to work with.

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**Petri Lehto**  
(PhD, Senior Lead at Sitra, the Finnish Innovation Fund)

Dr Lehto is a healthcare and innovation policy expert. He has worked as a Director of innovation policies at the Finnish Ministry of Economic Affairs and as Director in a global pharmaceutical company leading the company's policy and communications work in Finland. Currently, he focuses on increasing the use of health data in Finland and in the EU. He holds a Ph.D. in economics.

**What are some of the major challenges that Finland has faced in harnessing health care data effectively, and how has the country addressed or overcome these challenges?**

Legislation has been the biggest hurdle since we had no models from other countries for constructing it. Then came also GDPR which still complicated things. But we did succeed. We are now paying attention to making the data truly flow inside the health care system since we have noticed that there are obstacles in it and those refrain us from getting all the benefits out of it.

**What are some emerging trends or future directions in health care data management and utilization that you see shaping the landscape, both in Finland and globally?**

Finland has just gone through the biggest ever healthcare reform of the country. It has revealed many challenges we need to overcome in the coming years, like improving patient access, guaranteeing supply of professionals and meeting the budget pressure. We have started to pilot the use of artificial intelligence as a means to meet these challenges. AI is built on health data so we have a good starting point for all this. Again, the rewards are potentially massive but there is a lot of work ahead!

# Telehealth services and the health data space

In a society with a growing proportion of chronically ill people, integrated care is becoming increasingly important. Telehealth services can facilitate this form of care, as they can be used to offer customised telehealth solutions that regularly transmit health related data from patients to health professionals to treat chronic diseases, regardless of time and location.

For example, HerzMobil is a multidisciplinary disease Telehealth platform (developed by AIT for the care of patients with heart failure and is already being used in Tyrol, Styria and Carinthia).

The European Health Data Space (EHDS) is an initiative aimed at improving healthcare outcomes and fostering innovation within the European Union (EU) by facilitating the sharing and exchange of health data across borders. It aims to create a secure and interoperable infrastructure for accessing and analysing health data from various sources, including electronic health records, medical registries and research databases.

AIT focuses on infrastructure based topics to facilitate reproducible and high qualitative secondary use of health data towards EHDS. Secondary data use in healthcare is crucial for various reasons, primarily because it allows for the analysis of existing information collected under real world healthcare conditions. This data can be utilized for epidemiological studies, outcome assessments, health policy evaluations, and more, leading to insights that might not be achievable through primary data collection alone.

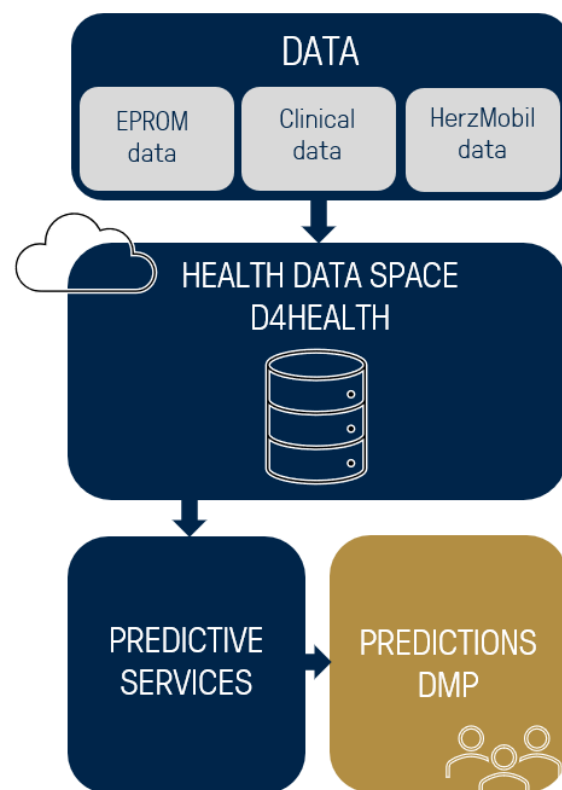
More and more people are using smartphone apps, wearables and monitoring devices and are part of telehealth services. The use of such devices and telehealth services generates data that creates the basis for a health data space.

Other data sources from HIS systems, registries or Patient Reported Outcome Measures (EPRO) can be merged and incorporated into this health data space. In summary, several data nodes form a comprehensive and quality assured database the d4Health Registry (Smart Registry), which is developed by AIT.

Integrating telehealth services with additional source systems such as Hospital Information Systems (HIS), Smart Registries, alongside the d4Health infrastructure developed by AIT, exemplified by initiatives like the d4Health Heart Failure Registry in Tyrol and Styria, highlights the significance of secondary data utilization in advancing healthcare innovation and improving patient outcomes. Such a registry offers many advantages. For example, direct access to the primary system is not necessary, which leads to better performance, Higher security levels and

pseudonymisation of the data. The data is transformed into a standardised data format (OMOP), which is well suited for evaluations and enables the automatic filling of the registry with data from standard care.

Furthermore Record linkage would not only be an advantage for the secondary use of data in the field of research, but also directly for the care of patients, by processing the data for quality assurance measures and reporting. Future plans are to link the registries attached to HerzMobil Tyrol and HerzMobil Styria into a joint d4Health registry, to support predictive analytics based on large sets of pseudonymised data, i.e., Big Data.



# Digital Revolution in Nursing

The digital turbo for patient care - KAGes and implementation partner CANCOM Austria AG are realizing a digital project for nurses and patients.



athetic support. But AMiS are not only time-saving machines but also true communication centers. Doctors, nurses, therapists - all involved in the treatment process - have mobile and real-time access to the current patient data. Misunderstandings and delays in information transmission are a thing of the past. This smooth communication and collaboration of all parties involved are essential for optimal patient care.

**KAGes, Alpatron Medical, and CANCOM Austria AG - a strong partnership**

The success of the project is due in no small part to the close and successful collaboration between KAGes, Alpatron Medical, and CANCOM Austria AG.

**Alpatron Medical** contributes expertise and experience in the development and production of innovative visitation carts.

**CANCOM Austria AG** is responsible as an implementation partner for implementing the solution in the IT infrastructure as well as at the individual locations of KAGes. CANCOM Austria AG would like to express its sincere appreciation and thanks to the entire team at KAGes. „At CANCOM Austria AG, we value the collaboration with the KAGes team greatly and look forward to continuing our successful partnership in future projects,” says Christoph Schreiner, BSc, MA, Sales Expert Digital Health, CANCOM AG Austria.

Styria takes a leading position in hospital digitalisation. KAGes (Steiermärkische Krankenanstaltengesellschaft m.b.H.) and its implementation partner CANCOM Austria AG have impressively demonstrated how these mobile helpers can revolutionise patient care. There are groundbreaking advantages for both medical/nursing staff and patients.

**Smart Computer on wheels save valuable time for humanity**

The era of illegible handwriting and lost notes at the bedside is coming to an end. In Styrian hospitals, digitalisation heralds a new era with the innovative visitation carts (AMiS) from Alpatron Medical. These mobile helpers revolutionise the daily work of doctors and nurses and bring several benefits.

With AMiS, doctors and nurses capture all relevant information directly at the patient's bedside using the integrated computer. The entered data is automatically transmitted to the electronic patient record in real-time. Time-consuming transcriptions and duplicate data entry are finally eliminated.

This gained time directly benefits the patients. Doctors and nurses can now devote themselves even more intensively to human care, providing informative discussions, individual care, and emp-







RobotDreams

## The future of diagnostics from the heart of Styria: how RobotDreams® GmbH is revolutionizing the diagnosis of acute coronary syndromes with its AI

In medicine, there is hardly anything more valuable than the ability to recognize diseases at an early stage and treat them appropriately. However, the diagnosis of acute coronary syndrome, commonly known as a heart attack, often results in late or even incorrect diagnoses due to lengthy and inaccurate troponin tests. This is not only expensive for the clinics that subject patients to unnecessary treatment but can be acutely life-threatening in the case of an unrecognized heart attack. However, this gap in diagnosis could soon be a thing of the past thanks to an AI platform developed by RobotDreams® from Graz.

The main problem in diagnosing such syndromes is that current troponin tests often require several test iterations. Also, heart attacks in women are often not recognized because the symptoms such as chest pain, dizziness, and nausea are not as specific as in men. In addition, in many cases, the troponin level in the blood does not rise as significantly in wo-

men as it does in men. This means that a troponin test cannot clearly diagnose a heart attack.

This is where the innovative AI platform from RobotDreams® comes in. The AI is based on data that was previously unused. It uses blood samples that are examined using hematology analyzers. In contrast to what the doctor recognizes with their own eyes, the AI can work with a wealth of data and recognize complex correlations between different values. Thanks to the planned direct connection to the analyzers via a cloud solution, AI can be used very quickly and extremely efficiently in the future. It also has a much higher specificity than the troponin tests used and can therefore make precise and reliable diagnoses.

RobotDreams® is currently conducting a large study in collaboration with the Medical University of Graz to verify the effectiveness and benefits of this innovative solution. RobotDreams' AI promises



Autor: Philipp Robin, Intern

not only a revolution in the diagnosis of acute coronary syndromes and other diseases in the future but also a significant step towards gender-equitable medicine. Thanks to this technology, people around the world could be diagnosed faster and more accurately and therefore treated more effectively, which will ultimately save lives.

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Alagnostikum

## RAIDAS – an AI system for breast cancer detection using MRI images

Breast cancer ranks as one of the most common cancers among women, making early detection through routine screening critical for improving survival rates. While mammography has long been the standard method for breast cancer screening, it has limitations, especially in women with dense breast tissue where its effectiveness is reduced. Magnetic Resonance Imaging (MRI) has emerged as a superior alternative, offering enhanced sensitivity without the need for ionizing radiation, making it a particularly valuable tool in the fight against breast cancer.

In this evolving landscape, Alagnostikum has introduced RAIDAS (Radiology AI Diagnostic Assistant System), an advanced artificial intelligence system engineered to detect malignant breast lesions in MRI images with remarkable precision. RAIDAS integrates seamlessly with Picture Archiving and Communication Systems (PACS), automatically accessing MRI images and analysing them without altering the radiologist's workflow.

The integration of RAIDAS into clinical practice is designed to complement, not replace, the radiologist's expertise. Initially, radiologists examine the MRI series using conventional methods, categorizing images based on the Breast Imaging Reporting and Data System (BI-RADS), thus formulating a diagnosis without AI interference. The RAIDAS system then presents its findings, allowing radiolo-

gists to compare their initial assessments with the AI's analysis. This process not only validates the radiologist's diagnostic decisions but also provides additional insights by highlighting the specific areas within the MRI data that influenced the AI's conclusions.

This dual-review strategy not only reinforces the accuracy of breast cancer detection but also provides a safety net by identifying potentially overlooked lesions.

RAIDAS represents a significant step forward in the fight against breast cancer. By providing radiologists with an advanced tool for analysing MRI images, the system offers the potential to improve diagnostic accuracy, reduce the risk of missed lesions, and ultimately enhance patient outcomes. As AI technology continues to evolve, systems like RAIDAS will become increasingly integral to the early detection and treatment of breast cancer, promising a future where technology and human expertise work hand in hand to save lives.



About the author:  
Dr. Manfred Prantl is heading Alagnostikum GmbH as CEO now for 4 years. He holds a doctoral degree in Computer Vision and Image Processing from the Technical University of Graz.

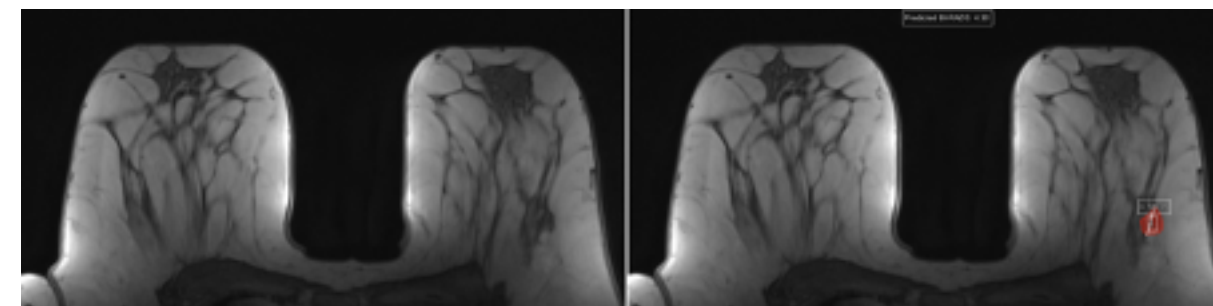


Figure 1: Breast MRI image (left: original T1 image; right: lesion identified by RAIDAS); the BI-RADS score given by the radiologist was 4 - the BI-RADS score predicted by RAIDAS was 4.3

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ilvi GmbH

# From handwriting to efficient healthcare: ilvi's data management solutions

Access to healthcare data has a significant impact on the quality and efficiency of care, and ilvi GmbH is playing a crucial role. Its software solutions facilitate the collection, management, and secure exchange of healthcare data and thus contribute to more efficient healthcare provision.

Large amounts of data are generated daily in the healthcare sector, often still based on handwritten records. This is where ilvi relies on digitalisation to optimise the process. With its "ilviCLINIC" solution, all information is recorded directly at the point of care - at the patient's bedside, whether through manual input or the integration of medical devices, from patient data and vital parameters to meal plans and wound images.

ilvi's solutions are designed with simplicity in mind. With a user-friendly interface, the collected information can be securely transferred to the relevant target systems with just one click. Whether it's the care documentation system or hospital information system, ilvi ensures a smooth and secure data transfer, relieving healthcare staff of manual data entry processes.

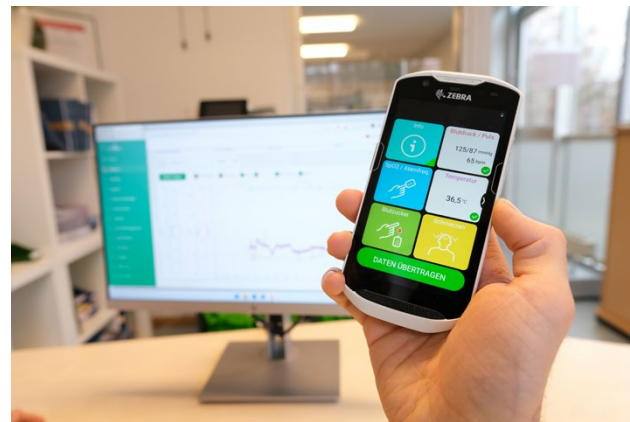
ilvi's strength lies not just in its solutions but also in its collaborative approach. By partnering with companies like SteadySense, ilvi continuously enhances the functionality of its solutions, contributing to the overall optimisation of healthcare. ilvi's open platform enables partners to seamlessly send their collected health data to the desired target system, fostering a culture of collaboration in the healthcare industry.

In addition to mobile applications, ilvi also offers desktop and connectivity solutions that facilitate the exchange of data between various healthcare applications or medical devices and the target system.

Overall, the work of ilvi GmbH contributes significantly to improving healthcare efficiency, accuracy and safety. Their innovative solutions ensure that healthcare data is efficiently captured, managed and securely exchanged, ultimately leading to better patient care.



Wireless data transfer from medical devices



ilviCLINIC with its backend solution for interdisciplinary data exchange

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Institute DIGITAL of JOANNEUM RESEARCH

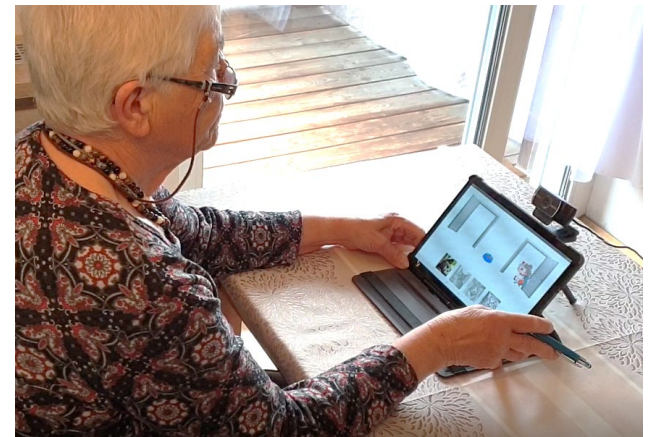
# Early detection of dementia risk from digital biomarkers with eye tracking and serious games

Dementia is a major public health problem with enormous social and economic costs on healthcare systems as well as substantial burden for the individual, caregiver and families. It is estimated that more than 7 million people are living in the European Union with dementia. This number is projected to double, reaching 14 million in 2050. There is currently no cure for dementia's most prominent disease, i.e., Alzheimer's disease (AD). Although the search for potential treatments is showing promise, it is anticipated that these interventions, such as, multi-domain non-pharmacological intervention, will be most effective in early stages of the disease.

The Institute DIGITAL of JOANNEUM RESEARCH has rich experience in developing and applying digital technologies for the assessment of dementia risk. Client engagement for the utilisation of assessment technologies is significantly increased using playful interaction, such as, in serious games (Paletta et al., 2018). Gamified exercises can perform in analogy with psychological tests and provide not only screening information, by estimating MoCA (Montreal Cognitive Assessment) or MMSE (Mini-Mental State Exam) scores, but also measure capacities of cognitive domains, such as, short term memory and attention.

The cognitive assessment even increases in accuracy with the analysis of sensorimotor behaviour. The serious game MIRA (Mobile Instrumental Recovery of Attention; Paletta et al., 2020) provides an eye tracking-based interface on a consumer-grade tablet or PC that can be applied easily at home. The user can activate good or bad avatars with its eye gaze; at the same time an anti-saccadic measurement schema is implicitly evaluated that has been approved in the lab environment to discriminate healthy persons from persons with AD. With intelligent analytics on eye tracking and interaction data a risk stratification was enabled to categorise into healthy behaviour, persons with risk for mild cognitive impairment, and persons with risk of mild dementia.

DIGITAL is currently project partner of PREDICTOM, a European Innovative Health Initiative with an €21 million investment to pioneer early Alzheimer's detection. The goal of PREDICTOM is to develop a screening platform capable of identifying people at risk of dementia, before the first symptoms appear. DIGITAL's contribution to the project is in progressing digital biomarker discovery using eye tracking data as well as in applying its knowledge about digital platforms.



Lucas Paletta



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innovative  
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JOANNEUM  
RESEARCH  
DIGITAL





Know Center

## Shaping the Future: Trusted AI and Data Science with the Know Center

Today, the sustainable utilization of new technologies is more crucial than ever for businesses and organizations. Given the rapid advancements in areas such as artificial intelligence (AI), navigating through these new circumstances correctly is essential to remaining competitive. As a leading European innovation and research center, the Know Center plays a central role in assisting businesses and organizations in mastering the opportunities and challenges of digital transformation.

The research center has particularly specialized in the fields of trusted AI and data science, which play a key role in the rapidly evolving landscape of digital transformation. This expertise enables companies and organizations to overcome complex obstacles such as intricate machine learning models (MLMs) and biases in training data, while simultaneously opening up new opportunities for implementing AI solutions that fully leverage their potential.

An outstanding example of the Know Center's work is the FFG project Simpli-fAI. Here, the center is working on transforming complex medical reports using Natural Language Processing (NLP) to make them more understandable for patients. This initiative is crucial for healthcare, as easily understandable reports enhance patient education and facilitate communication between doctors and patients, ultimately leading to better health outcomes.

Collaborating with the Know Center not only provides companies and organizations with access to leading expertise and services in the field of AI and data science but also offers a partnership based on trust and transparency. By adopting and implementing trusted AI and data practices, they can successfully operate in a rapidly changing environment. This can not only strengthen their own competitiveness but also actively contribute to shaping an innovative and sustainable



Maria Fellner

future for the economy and society. Learn more about the work of the Know Center and its projects at [www.know-center.at](http://www.know-center.at).

Know Center Contact:  
Maria Fellner  
Business & Transformation  
[mfellner@know-center.at](mailto:mfellner@know-center.at)



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JOANNEUM RESEARCH HEALTH Geriatric Care

## Leveraging Real-World Data for Enhanced Geriatric Care

As demographics shift towards aging populations, the demand for effective healthcare solutions intensifies. Geriatric patients, aged 65 and above, often face acute events threatening their independence and autonomy, characterized by multimorbidity and high vulnerability.

JOANNEUM RESEARCH together with Austrian geriatricians has pioneered an online system for benchmarking and reporting "BARS" since 2008, enabling the collection of structured real world data from geriatric wards, aiming at improving geriatric care in Austria. Participating facilities voluntarily contribute data, enabling identification of best practices and areas for improvement. Despite the absence of financial incentives, about 40% of Austrian acute geriatric facilities actively engage in this vital endeavor.

Geriatric care entails considering individual health conditions and multimorbidity. Geriatric assessments play a crucial role in identifying risk factors, enhancing treatment outcomes, and reducing healthcare costs. However, these assessments require specialized geriatric knowledge which is lacking in many hospitals.

To overcome this, JOANNEUM RESEARCH in collaboration with Predicting Health, is developing a digital method using AI to predict geriatric patient risk potential, based on BARS database. This project, co-financed by FFG, aims to create a resource-efficient, semi-automated approach for identifying and predicting risk factors using digital biomarkers.

By harnessing AI, this method seeks to identify risks such as frailty, delirium, dysphagia, and susceptibility to falls early, enabling proactive interventions and tailored patient care also in non-geriatric settings. Ultimately, this digital solution holds promise for enhancing care quality while optimizing resource utilization across healthcare settings.

In conclusion, the utilization of real-world data combined with AI offers unprecedented opportunities to revolutionize geriatric care. JOANNEUM RESEARCH's commitment to advancing digital healthcare solutions underscores its dedication to improving patient outcomes and driving innovation in healthcare data analytics.

With ongoing advancements in technology and collaboration between research institutions and healthcare providers, the future of geriatric care looks promising. Efforts to leverage real-world data and AI will continue to play a pivotal role in enhancing the quality of care for elderly populations, ensuring they receive the personalized and comprehensive support they deserve in their later years.



Franz Feichtner

JOANNEUM RESEARCH HEALTH Contact:  
Dr. Franz Feichtner, Director  
[franz.feichtner@joanneum.at](mailto:franz.feichtner@joanneum.at)



# Data donation as a key to enhancing clinical research in Austria

AIT-led “Smart FOX” project promises to democratize health data

The “Smart FOX” project, led by the AIT Austrian Institute of Technology, marks a revolutionary step in clinical research in Austria. By encouraging citizens to donate their health data for research purposes, the project paves the way for more efficient clinical research, improved healthcare, and optimized system control in healthcare.

The project involves 19 partners from healthcare, research, and industry, reflecting a multidisciplinary effort. With a budget of 3.4 million Euros, partly funded by the Austrian Research Promotion Agency (FFG), the two-year project aims to overcome data fragmentation in healthcare—a significant hurdle for data-driven clinical research in Austria.

„Smart FOX seeks to bridge the gap between the availability and utilization of health data, marking a turning point not only for research but also for patient care,” explains Dr. Klaus Donsa, Project Leader and Senior Scientist at AIT’s Center for Health and Bioresources. The pandemic highlighted the critical need for efficient data networking to manage health challenges. Integrating these data through a system-wide approach allows for the development of new therapies and optimization of patient care, enhancing Austria’s competitiveness in the health sector and the attractiveness of its research environment. „By using standardized data from

the national health record system ELGA and involving all relevant stakeholders, our vision with Smart FOX is to significantly boost research efficiency,” emphasizes Donsa. The collaboration between citizens, scientists, industry, and healthcare is key to the project’s success.

Looking ahead, Smart FOX represents a new era in Austrian health research. „With active citizen participation, we can not only improve medical care with innovative solutions but also hope to relieve the healthcare system sustainably,” concludes Donsa. The project is poised to pioneer the networking of health data in Austria, a crucial issue that is gaining importance at the European level with activities around the European Health Data Space.

For more information on the project, visit [www.smart-fox.at](http://www.smart-fox.at).



**About AIT:**  
The AIT Austrian Institute of Technology is Austria’s largest non-university research institution, leading in developing innovative solutions for modern societal challenges.

**Contact:**  
DI Dr. Klaus Donsa, BSc  
Senior Scientist  
Digital Health Information Systems  
Center for Health & Bioresources

AIT Austrian Institute of Technology  
Reininghausstraße 13/1, 8020 Graz  
Austria  
Email: [klaus.donsa@ait.ac.at](mailto:klaus.donsa@ait.ac.at)  
[www.ait.ac.at](http://www.ait.ac.at)



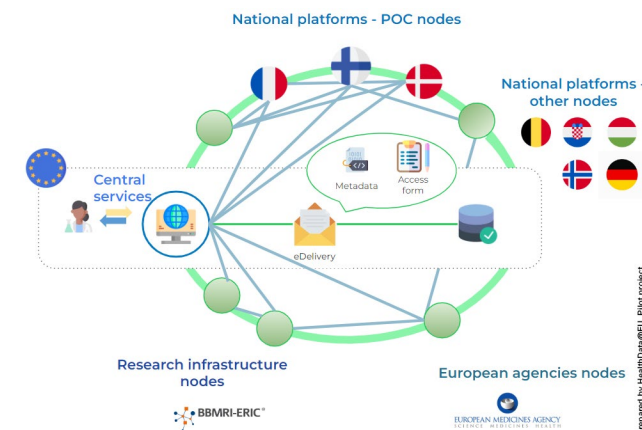
Smart FOX Flagship Project Kick-off Meeting in Vienna 22/23 Jan. 2024

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# Cross-border Use of Health Data in the EU – The EHDS2Pilot Project

The European Health Data Space (EHDS) regulation proposal covers two areas EHDS-1 (MyHealth@EU) and EHDS-2 (HealthData@EU). Their major aim is providing a European Union wide framework for cross-border use of personal health data for healthcare provision (MyHealth@EU) and the secondary use of health data which will serve research, innovation, policy making and regulatory purposes (HealthData@EU).

The HealthData@EU Pilot project has been launched in 2022 with two objectives: (a) to pilot EHDS-2 concepts according to the regulation proposed by the European Commission on 5 specific scientific use cases covering domains from public health to cancer research; (b) to support this cross-border infrastructure with development and guidance on standards on data interoperability, quality, security and transfers. The project is implemented by a consortium of 17 organisations, including health data access bodies (HDAB), life science research infrastructures and European agencies, in close cooperation with the central services teams of the European Commission. Priority services of the pilot include a metadata discovery service and a common health data access request. The piloting will be done within 5 use cases that deal with: (1) antimicrobial resistance surveillance; (2) identifying the risks of coagulation disorders in patients with Covid-19; (3) testing use, hospitalizations and vaccination adherence in vulnerable sub-populations; (4) anticipating care pathways in cardio-metabolic diseases using AI; and (5) identifying genomic signatures characteristic of different types of colorectal cancers.



BBMRI-ERIC takes on two roles in the project: as an R&D partner and as a potential HDAB for the future. BBMRI-ERIC is one of the leading research infrastructures in the life sciences area with a fully operational IT-infrastructure for discovery and access facilitation on bio samples, attached data and corresponding services but also a very lively network of more than 400 organisations mainly within the EU. BBMRI-ERIC with its network partners provides knowledge and recommendations on technical and ethical/legal aspects (e.g. interoperability, quality and security of data based on real use cases; regarding data access and piloting of the data access portal) to the project. In addition, BBMRI-ERIC is feeding IT components into the pilot infrastructure, such as the BBMRI-ERIC Negotiator for negotiation on data access requests and parts of its Federated Platform for resource discovery and sequential data requests.

The HealthData@EU Pilot project is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HaDEA. Neither the European Union nor the granting authority can be held responsible for them.

